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EXAMINER

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/723,859

Filing Date: November 26, 2003

Appellant(s): AVINASH ET AL.

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John M. Rariden

For Appellant

**EXAMINER'S ANSWER**

This is in response to the administrative remand from the Board of Appeals of 27 May 2010 and replaces the Examiner's Answer of 21 August 2009.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

No amendment after final has been filed.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. New grounds of rejection are presented herein as follows: Claims 13-24 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter, and claims 13-24 and 35 are rejected under 35 U.S.C. 112, 2<sup>nd</sup> paragraph, as reciting indefinite functional language.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,363,844     Riederer et al.     11-1994

**(9) Grounds of Rejection**

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The following ground(s) of rejection are applicable to the appealed claims:

***Claim Rejections – 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-12 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter because these are method or process claims that do not transform underlying subject matter (such as an article or materials) to a different state or thing, nor are they tied to another statutory class (such as a particular machine). See Diamond v. Diehr, 450 U.S. 175, 184 (1981) (quoting Benson, 409 U.S. at 70); Parker v. Flook, 437 U.S. 584, 588 n.9 (1978) (citing Cochrane v. Deener, 94 U.S. 780, 787-88 (1876)). See also In re Bilski (Fed Cir. 2007-1130, 10/30/2008) where the Fed. Cir. held that method claims must pass the "machine-or-transformation test" in order to be eligible for patent protection under 35 USC 101.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 10-20, 22-32 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Riederer et al (US Patent No. 5,363,844), hereinafter referred to as Riederer ('844).

**Regarding claims 1-4 and 13-16**, Riederer ('844) discloses a method and program including the steps of acquiring a set of motion data during a breath hold, deriving an attribute of motion from the set of motion data, deriving an initiation threshold and termination threshold from the attribute, and generating a

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set of gated image data using gating intervals derived from the thresholds (col. 5 lines 31-53, col. 6 line 29-36). Riederer ('844) discloses that the set of motion data is acquired from a navigator pulse sequence, which is the same as acquiring a set of pre-acquisition image data as claimed in the instant application (col. 5 lines 5-58). Riederer ('844) discloses that the displacement of the diaphragm may be detected via the NMR system, which constitutes an electrical sensor, and respiratory bellows, which constitute non-electrical sensors (col. 2 lines 14-15, col. 5 lines 34-37, col. 7 lines 2-6).

**Regarding claims 5-8 and 17-20**, Riederer ('844) shows that the image data is acquired when a first measurement of motion decreases below an initiation threshold, and acquisition ceases when motion increases above a termination threshold, wherein the beginning and end of the breath hold disclosed by Riederer ('844) constitute the initiation and termination thresholds, respectively, as claimed in the instant application (Fig. 3). Furthermore, the duration of the breath hold disclosed by Riederer ('844) constitutes a quiet period as claimed in the instant application. Riederer ('844) also discloses that the motion measurements are acquired concurrently with the image data (col. 5 lines 37-36).

**Regarding claims 10-11 and 22-23**, Riederer ('844) states that a respiration monitor is used to detect an acceptable breath-hold, and to generate the respiratory trigger pulse, which is the same as determining if a scan parameter is satisfied and acquiring image data based on the scan parameter as claimed in the instant application (col. 5 lines 48-54). In the method of Riederer ('844), the absence of the respiratory trigger pulse when the breath-hold is not acceptable is the same as a notification as claimed in the instant application.

**Regarding claims 12 and 24**, Riederer ('844) discloses a step and routine for providing a visual notification to the patient indicating breath hold status (col. 6 lines 54-66).

**Regarding claims 25-29 and 35**, Riederer ('844) discloses an imaging system and computer programs for performing the method of claims 1-12 of the instant application, wherein the system comprising an imager configured to generate a plurality of signals representative of the diaphragm and heart, data acquisition circuitry, data processing circuitry, system control circuitry for generating a set of gated image data, an operator workstation, a sensor-based motion determination system to measure electrical and non-electrical attributes of one or more organs, wherein the sensor-based motion determination system employs respiratory bellows, which constitute pressure sensors (Fig. 1, col. 7 lines 2-6, col. 3 line 4 – col. 5 line 30).

**Regarding claim 30**, Riederer ('844) provides means for generating gated image data by activating the imager based upon a gating interval (col. 2 lines 11-13).

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**Regarding claim 31**, Riederer ('844) discloses means for generating gated image data by registration, which constitutes selectively processing a plurality of signals based upon gating intervals (col. 2 lines 38-41).

**Regarding claim 32**, the system of Riederer ('844) includes a color-coded visual feedback device configured to notify the patient of a breath hold status based upon data from a sensor-based motion determination system (col. 6 lines 54-66).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riederer (US Patent No. 5,363,844). Riederer ('844) teaches all features of the present invention as previously described in this Office Action. While Riederer ('844) teaches displaying the motion data and determining if the gating intervals are acceptable, Riederer ('844) does not explicitly teach the step of replacing the thresholds or gating intervals if they are determined to be unacceptable (col. 5 lines 48-50). However, it would have been obvious to one of ordinary skill in the art at the time of invention to add this step to the method of Riederer ('844), as it is well known in the art that image data acquired during an unacceptable gating interval is not accurate or useful.

### ***New Grounds of Rejection***

Claims 13-24, directed towards a computer program embodied on a computer-readable medium, are rejected under 35 U.S.C. § 101 as towards non-statutory subject matter. The United States Patent and Trademark Office (USPTO) is obliged to give claims their broadest reasonable interpretation consistent

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with the specification during proceedings before the USPTO (*In re Zletz*, 893 F.2d 319 Fed. Cir. 1989); in other words, during patent examination, the pending claims must be interpreted as broadly as their terms reasonably allow. The broadest reasonable interpretation of a claim drawn to a program embodied on a computer readable medium (also called a machine readable medium and other such variations) typically covers forms of non-transitory tangible media and transitory propagating signals *per se* in view of the ordinary and customary meaning of computer readable media, particularly when the specification is silent (MPEP § 2111.01). Accordingly, since the broadest reasonable interpretation of claims 13-24 covers a signal *per se*, the claims are considered as covering non-statutory subject matter (*In Re Nuijten*, 500 F.3d 1436, 1356-57 Fed. Cir. 2007; *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. 101*, 24 Aug 2009 p. 2).

Claim 35 is rejected under 35 USC § 112, ¶ 2, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites the following means (or step) plus function limitation: means for deriving one or more attributes of motion from the set of respiratory motion data, means for deriving an initiation threshold and a termination threshold from the one or more attributes, and means for generating a set of gated image data.

This limitation invokes 35 USC § 112, ¶ 6 because it meets the 3-prong analysis set forth in MPEP 2181 as it recites the phrase “means for” or “step for” (or appellant identifies the limitation as a means (or step) plus function limitation in the appeal brief) and the phrase is modified by functional language and it is not modified by sufficient structure, material, or acts for performing the recited function. Also see *Altiris Inc. v. Semantec Corp.*, 318 F.3d 1363, 1375 (Fed. Cir. 2003). 35 USC § 112, ¶ 6, requires such claim to be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. “If one employs means plus function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section § 112.” *In re Donaldson Co.*, 16 F.3d 1189, 1195, 29 USPQ 1845, 1850 (Fed. Cir. 1994)(in banc.). For a computer-implemented means-plus-function claim limitation that invokes 35 USC § 112, ¶ 6, the corresponding structure is required to be more than simply a general purpose computer. *Aristocrat Technologies, Inc. v. International Game Technology*, 521 F.3d 1328, 1333, 86 USPQ2d 1235, 1239-40 (Fed. Cir. 2008). The corresponding structure for a computer-implemented function must include the algorithm as well as the general purpose computer. *WMS Gaming, Inc. v. International Game Technology*, 184 F.3d 1339, 51

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USPQ2d 1385 (Fed. Cir. 1999). The written description must at least disclose the algorithm that transforms the general purpose microprocessor to a special purpose computer programmed to perform the claimed function. *Aristocrat*, 521 F.3d at 1338, 86 USPQ2d at 1242.

In the instant application, the following portions of the specification and drawings may appear to describe the corresponding structure for performing the claimed function: the imaging system 10 described at page 14 line 11 through page 15 line 5, and shown in Figs. 2 & 3.

However, the specification and drawings do not disclose sufficient corresponding structure, material or acts for performing the claimed function. It appears that the attributes, thresholds and gated image data are derived and generated, respectively, by software in the general purpose computer that is disclosed as part of the claimed structure. However, the specification does not describe how the attributes or thresholds are determined, or how the gated image data is generated. Specifically, the specification does not provide the algorithms for the claimed means for determining the attributes, the claimed means for determining the threshold, or the claimed means for generating the gated image data, and, as such, Appellants have failed to adequately describe sufficient structure for performing the functions claimed.

Claim(s) 13-24 are rejected under 35 USC § 112, ¶ 2, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim(s) recites/recite the following means plus function limitation: a routine for acquiring a set of motion data, a routine for deriving one or more attributes of motion from the set of motion data, a routine for deriving an initiation threshold and a termination threshold from the one or more attributes, and a routine for generating a set of gated image data using the initiation threshold and the termination threshold.

The claim limitation does not use the term “means for” or “step for” which triggers a rebuttable presumption that 35 USC § 112, ¶ 6, does not apply. However, this presumption may be rebutted if the claim limitation uses a term that is not an art-recognized structure to perform the claimed function, the term is modified by functional language, and the term is not modified by sufficient structure or material for performing the claim function. *See Ex parte Rodriguez*, 92 USPQ2d 1395, 1404-1406 (Bd. Pat. App. & Int. 2009).

Here, appellant’s claim limitation begins with a term followed by functional language and the term is not modified by sufficient structure or material for performing the claimed function. Furthermore, the specification does not provide a description sufficient to inform one of ordinary skill in the art the meaning of the term; and the term is not an art-recognized structure to perform the claimed function. Accordingly, the limitation invokes 35 USC § 112, ¶ 6.

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35 USC § 112, ¶ 6, requires such claim to be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. “If one employs means plus function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section § 112.” *In re Donaldson Co.*, 16 F.3d 1189, 1195, 29 USPQ 1845, 1850 (Fed. Cir. 1994)(in banc.). For a computer-implemented means-plus-function claim limitation that invokes 35 USC § 112, ¶ 6, the corresponding structure is required to be more than simply a general purpose computer. *Aristocrat Technologies, Inc. v. International Game Technology*, 521 F.3d 1328, 1333, 86 USPQ2d 1235, 1239-40 (Fed. Cir. 2008). The corresponding structure for a computer-implemented function must include the algorithm as well as the general purpose computer. *WMS Gaming, Inc. v. International Game Technology*, 184 F.3d 1339, 51 USPQ2d 1385 (Fed. Cir. 1999). The written description must at least disclose the algorithm that transforms the general purpose microprocessor to a special purpose computer programmed to perform the claimed function. *Aristocrat*, 521 F.3d at 1338, 86 USPQ2d at 1242.

In the instant application, the following portions of the specification and drawings may appear to describe the corresponding structure for performing the claimed function: the imaging system 10 described at pages 14-15 as being used to executed the routines, and as shown in Figures 2 and 3.

However, the specification and drawings do not disclosure sufficient corresponding structure for performing the claimed function. It appears that the attributes, thresholds and gated image data are derived and generated, respectively, by software in the general purpose computer that is disclosed as part of the claimed structure. However, the specification does not describe how the attributes or thresholds are determined, or how the gated image data is generated. Specifically, the specification does not provide the algorithms for the claimed means for determining the attributes, the claimed means for determining the threshold, or the claimed means for generating the gated image data, and, as such, Appellants have failed to adequately describe sufficient structure for performing the functions claimed.

#### **(10) Response to Argument**

##### *a) Definition and interpretation of the term “gating”*

Appellant alleges that Examiner has made a legal error by improperly relying upon extrinsic evidence to define a term “already fully explained” in the pending specification (Appeal Brief, p. 8-10).

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Specifically, Appellant purports that Examiner's interpretation of the term "gating" as recited in the instant claims is improper for being "overly expansive" in view of the claim language and the teachings of the instant specification. Appellant references page 1 lines 23-26, page 4 lines 4-7, page 11 lines 11-15 for support of the argument that the term gating was defined as being derived from motion data.

The Examiner maintains that, although the claims have in fact been considered in light of the specification, it is the Examiner's duty to rely upon their broadest reasonable interpretation when determining patentability of those claims in view of the prior art. Nowhere in the above-referenced passages of the pending disclosure does Appellant explicitly set forth a re-definition of the term "gating" from that which is commonly known in the art as meaning *only* initiation and termination of a process based upon motion data. It has previously been held that, where an applicant wishes to act as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that term (*Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 Fed. Cir. 1999). A mere discussion of specific examples of types of gating, as is presented in page 1 lines 23-26, page 4 lines 4-7, page 11 lines 11-15 of the present specification, does not constitute such a statement. Accordingly, it is reasonable and proper for Examiner to rely upon the definition set forth in a general purpose dictionary, such as Merriam Webster, to determine the boundaries of the broadest reasonable interpretation of the term "gating".

*b) Termination of imaging based on motion attributes*

Appellant contends that the Riederer ('844) reference makes no suggestion that imaging terminates when the diaphragm begins moving, as is relied upon by Examiner in the current grounds of rejection (Appeal Brief p. 10-11). Specifically, Appellant purports that "all instances in the Riederer reference appear to characterize the data acquisition as continuing for a set time period".

While it is true that Riederer ('844) acquires image data for a set time period, Examiner maintains that this set time period does not teach away, nor is it mutually exclusive from the step of terminating image data acquisition at a motion threshold as recited in the current claims. Riederer ('844) states that the breath hold time ("set time period") is determined by using a respiration monitor to observe the acceptable amount of breath hold time for that particular subject, and the reference also goes on to state that "the degree of chest inflation is monitored with NMR measurements of the superior-inferior (S/I)

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position of the patient's diaphragm" (col. 5 lines 48-53). The length of the breath hold cycle is thus determined from motion data by Riederer ('844), and since image data acquisition is disclosed to occur concurrently to such a breath hold (col. 5 lines 28-30), one of ordinary skill would recognize that, in the reference method, image acquisition terminates at the end of the breath hold (Fig. 3), and this breath hold end constitutes a threshold as claimed. It is inherent that, upon termination of a breath hold, a patient's diaphragm begins to move in order to initiate normal respiration. Therefore, it can be said that Riederer ('844) does in fact terminate imaging at the initiation of diaphragm movement as stated in the previous rejection.

*c) Retrospective selection of gated image data*

Appellant contends that Riederer ('844) lacks disclosure of steps and means for selection of a set of gated image data from a set of image data (Appeal Brief p. 11). Appellant specifically alleges that the reference does not provide support for retrospective gating as claimed in the instant application.

Riederer ('844) discloses registration of movement data to image data (col. 2 lines 36-41). Such registration must inherently occur post-acquisition, as it is not possible to register two sets of data that have not yet been acquired. Examiner maintains that, by registering the image data to the diaphragm motion data, one is effectively identifying those portions of the image data that respond to the time period of least diaphragm movement, which is disclosed by the reference to be the desirable and useful portion of the image data (col. 1 lines 31-50, col. 2 lines 1-6). Riederer ('844) uses this portion of image data acquired during minimal movement to calculate an average dataset that has improved signal-to-noise ratio (col. 2 lines 36-48). By such post-acquisition selection of breath-hold image data, Riederer ('844) does in fact retrospectively gate the data.

*d) Determination of whether scan parameters are satisfied*

Appellant argues that Riederer ('844) does not disclose the step of determining if one or more scan parameters are satisfied (Appeal Brief p. 11).

Riederer states that "a respiration monitor is required to detect an acceptable breath-hold and to generate the respiratory trigger pulse" (col. 5 lines 48-51). Examiner interprets the step of detecting an acceptable breath-hold to constitute "determining if one or more scan parameters are satisfied" as is currently recited by the instant claims; i.e., the acceptability of the breath-hold is a scan parameter.

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**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner's answer contains a new ground of rejection set forth in section (9) above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

/Parikha S Mehta/

Examiner, Art Unit 3737

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**A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:**

/DONALD T HAJEC/

Director, Technology Center 3700

Conferees:

/BRIAN CASLER/

Supervisory Patent Examiner, Art Unit 3737

/Tom Hughes/

TQAS, TC 3700